CLAIMS

1. Method enabling a user:

(i) to produce a flow of synthetic images (3) in a data processing unit (2) composed of standard electronic circuits, and

(ii) to trace a scene (4) by creating visual interactions between the said flow of synthetic images (3), and at least a flow of video images (5)

so as to improve the quality of the scene (4) and reduce the processing time without employing expensive proprietary data processing units (2);

the said data processing unit (2), particularly of the consumer "PC computer type," comprising:

-a motherboard (7),

-a graphic board (8) for rendering and displaying the said scene (4), comprising a 2D/3D processing acceleration processor (5), a work buffer (10) ("back buffer") and a texture memory (11),

-a means of acquisition (12) making it possible to acquire, in real time, video images (13), in a video buffer (14); the said acquisition means (12) appearing particularly in the form:

of a video acquisition integrated in the said graphic board (8), and/or

of a video acquisition integrated in the said motherboard (7), and/or

of a video acquisition, via a dedicated acquisition board;

the said method comprising the step of performing a specific rendition of the said scene (4),

-upon each rendering of the said scene (4), copying the said video buffer (14) into a memory zone (10, 11) of the graphic board (8),

-tracing the said synthetic images (16) in the said work buffer (10) of the graphic board (8).

2. Method according to claim 1 for performing a specific rendition, the said method including the following steps:

-the step of copying, upon each rendering of the said scene (4), the said video buffer (14) into the said work buffer (10),

the step of tracing the said synthetic images (16) into the said work buffer (10).

3. Method according to claim 2, the said video buffer comprising interlaced video lines; for copying, upon each rendering of the said scene (4), the said video buffer (14) into the said work buffer (10), the said method comprising:

the step of copying the said even video lines (17), upon a first rendition, then

the step of copying the said odd video lines (18), upon the following rendition.

4. Method according to claim 1, for performing a specific rendition of the said method including:

the step of initializing prior to the specific rendition by creating a dedicated texture (19) in the said texture memory (11) of the said graphic board (8); the said dedicated texture (19) having the size of the said video buffer (14); the said dedicated texture (19) being dedicated to copying the said video buffer (14) into the said texture memory (11);

he said method furthermore comprising:

the step of copying the said video buffer (14) into the said dedicated texture (19),

the step of tracing the said scene (4) completely, using the said dedicated texture (19) to texture some of the polygons (20) of the said scene (4).

5. Method according to claim 4, the said video buffer (14) comprising interlaced video lines; to copy, upon each rendition of the said scene (4), into the said dedicated texture (19), the said method comprising:

the step of copying the said even video lines (17), at the time of a first

rendering, then,

the step of copying the said odd video lines (18), at the time of the following rendition,

the step of applying a translation from the video buffer (14) of more or less one half-line into the rendition of the said scene (4):

either by modifying the texture coordinates of the dedicated texture (19),

or by modifying the coordinates of the polygons (20) textured by the dedicated texture (19); (such that the image quality is thus improved).

6. Method according to any one of claims 1 to 5, the said acquisition means (12) comprising a driver (22) having a new video buffer (14) for each new video image; the rendering of the said scene (4) being performed in synchronism with the presentation of each new video buffer (14).

7. Method according to any one of claims 1 to 5, the said acquisition means (12) comprising a driver (22) having a new video buffer (14) for each new video image, the said method comprising the following steps:

the step of filling a buffer memory (23) with each new video buffer, employing a video capture performance unit (24) ("thread"),

the step of copying one of the video buffers (14) contained in the said buffer memory (23) into the said texture memory (11) of the graphic board (8),

the step of performing the rendition of the said scene (4) in an asynchronous manner in relation to the presentation of each new video buffer (14).

8. Method according to any one of claims 1 to 7, the said method comprising the step of applying an anti-aliasing function in the tracing of the said scene (4).

9. Method according to any one of claims 1 to 8, the said method comprising the step of applying a transparency function in the tracing of the said scene (4).

10. Method according to any one of claims 1 to 9, the said method comprising the step of applying nonlinear distortions to the video buffer (14) when texturing

polygons (20) of the said scene (4) by means of the said dedicated texture (19), (such that it is thus possible to correct optical distortions of the video image).

11. Method according to any one of claims 1 to 10, the said method comprising the step of applying to the video buffer (14) pixel shader functions permitting, especially, a processing of the chroma key type.

12. Method according to any one of claims 1 to 11, the said data processing unit (2) comprising means of acquisition (12) each having a video buffer (14); the said method comprising the following steps:

the step of copying the video buffer (14) of one of the said acquisition means (12) into a second dedicated texture of the graphic board (8),

the step of texturing at least in part the said scene (4) using the said second dedicated texture (such that it is thus possible to obtain real reflections on synthetic objects).

13. Method according to any one of claims 1 to 12, the said method including:

the step of slowing the copying of one of the video buffers (14) contained in a buffer memory (23) into the said texture memory (11) of the graphic board (8) (so that it is thus possible to slow the display of video images (13) with respect to the display of the synthetic images (16)).

System

14. System enabling a user:

i) to produce a flow of synthetic images (3) in a data processing unit (2) composed of standard electronic circuits, and

ii) to trace a scene (4) by creating visual interactions between the said flow of synthetic images (3) and at least one flow of video images (5),

such as to improve the quality of the scene (4) and reduce the processing time, without employing expensive proprietary data processing units;

the said data processing unit (2), especially of the consumer "PC computer" type comprising:

-a motherboard (7),

-a graphic board (8) for rendering and displaying the said scene (4), comprising a 2D/3D processing accelerating processor (9), a work buffer (10) ("back buffer") and a texture memory (11),

-a means of acquisition (12) making it possible to acquire video images (13) in real time in a video buffer (14), the said acquisition means (12) appearing especially in the form:

* of a video acquisition integrated into the said graphic board (8), and/or

* of a video acquisition integrated into the said motherboard (7),

and/of a video acquisition integrated into the said motherboard (7), and/or

* of a video acquisition via a dedicated acquisition board;

To perform a specific rendering of the said scene (4);

-the said motherboard (7) furthermore comprising data processing means 926) permitting the said video buffer (14), upon each rendition of the said scene (4), to be recopied into a memory zone (16) of the said graphic board (8),

-the said 2D/3D processing accelerating processor (9) comprising tracing means for tracing the said synthetic images (16) into a memory zone (15) of the said graphic board (8).

15. System according to claim 14, for performing a specific rendition:

-the said data processing means (26) comprising first copy means (27) for copying, upon each rendition of the said scene (4), the said video buffer (14) into the said work buffer (10),

-the said 2D/3D processing acceleration processor comprising first computing means (29) for tracing the said synthetic images (16) into the said work buffer

(10).

16. System according to claim 15, the said video buffer (14) comprising interlaced video lines, the said first copy means (27) of the said video buffer (14) in the said work buffer (10) comprising:

-first selection and copy means (30) of the said even video lines (17), at the time of the first rendering, then

-second selection and copy means (31) of the odd video lines (18) at the time of the next rendering.

17. System according to claim 14, for performing a specific rendering the said data processing means (26) include means for initialization creating, prior to the specific rendition, a dedicated texture (19) in the said texture memory (11) of said graphic board (8), the said dedicated texture (19) having the size of the said video buffer (14);

to carry out a specific rendition , the said data processing means (26) furthermore include second copy means (33) for copying the said video buffer (14) in the said dedicated texture (19);

to carry out a specific rendition the said 2D/3D processing accelerating processor (9) includes second means of computation (34) to completely trace the said scene (4), using the said dedicated texture (39) for texturing certain of the polygons (20) of the said scene (4).

18. System according to claim 17, the said video buffer (14) comprising interlaced video lines, the said second copy means (33) of said video buffer (14) in the said dedicated texture (19) comprising:

-third means of selection and copy of said even video lines (17), in a first rendition, then

-fourth means of selection and copy (36) of said odd video lines (18), in the following rendition,

-third means of calculation (17) for applying a translation (21) from the video

buffer (14) of more or less one half-line in the rendition of the said scene (4);

-either by modifying the texture coordinates of the said dedicated texture (19),

-or by modifying the coordinates of polygons (20) textured by the said dedicated texture (15) (so that the image quality is thus improved).

19. System according to any one of claims 14 to 18, the said acquisition means (12) including a driver (22) having a new video buffer (14) for each new video image; the said data processing means (26) performing the rendition of the said scene (4) synchronously with the presentation of each new video buffer (14).

20. System according to any one of claims 14 to 18, the said acquisition means (12) having a driver (22) presenting a new video buffer (14) for each new video image, the said data processing means (16) comprising:

-transfer means for filling a buffer memory (23) with each new video buffer (14), employing a unit of execution (24) ("thread") of video capture,

-third copy means for copying (38) one of the video buffers contained in the said buffer memory (23) into the said texture memory (11) of the graphic board (8);

the said data processing means (26) performing the rendition of the said scene (4) asynchronously with respect to the presentation of each new video buffer (14).

21. System according to any one of claims 14 to 20, the said data processing means (26) making it possible to apply an anti-aliasing function when the said scene (4) is being traced.

22. System according to any one of claims 14 to 21, the said data processing means (26) making it possible to apply a transparency function when the said scene (4) is being traced.

23. System according to any one of claims 14 to 22, the said data processing means (26) making it possible to apply non-linear distortion to the video

buffer (14), texturing polygons (20) of the said scene (4) by means of the said dedicated texture (19), (so that it is thus possible to correct optical distortions of the video image).

24. System according to any one of claims 14 to 23, the said data processing means (26) making it possible to apply to the video buffer (14) pixel shader functions permitting, especially, processing of the chroma key type.

25. System according to any one of claims 14 to 24, the said data processing means (26) making it possible to copy the video buffer (14) from one of the said acquisition means into a second dedicated texture of the graphic board (8), the said 2D/3D processing acceleration processor (9) making it possible to texturize the said scene (4) at least in part by using the said second dedicated texture, (so that it is thus possible to obtain some real reflections on synthetic objects).

26. System according to any one of claims 14 to 25, the said date processing means (26) making it possible to slow the copy of one of the video buffers (14) contained in a buffer memory (23) into the said texture memory (151) of the graphic board (8), (so that it is thus possible to slow the display of the video images (13) with respect to the display of the synthetic images (16)).